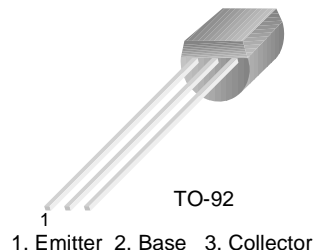


NPN Switching Transistor

- This device is designed for high speed saturated switching at collector currents of 10mA to 100mA.
- Sourced from process 21.



Absolute Maximum Ratings* $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{CEO}	Collector-Emitter Voltage	15	V
V_{CBO}	Collector-Base Voltage	40	V
V_{EBO}	Emitter-Base Voltage	4.5	V
I_C	Collector Current - Continuous	200	mA
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 ~ 150	$^\circ\text{C}$

* This ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

- 1) These rating are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Electrical Characteristics $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
Off Characteristics					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage *	$I_C = 10\text{mA}, I_B = 0$	15		V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$I_C = 10\mu\text{A}, V_{BE} = 0$	40		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\mu\text{A}, I_E = 0$	40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10\mu\text{A}, I_C = 0$	4.5		V
I_{CBO}	Collector Cutoff Current	$V_{CB} = 20\text{V}, I_E = 0$ $V_{CB} = 20\text{V}, I_E = 0, T_a = 125^\circ\text{C}$		0.4 30	μA
On Characteristics					
h_{FE}	DC Current Gain *	$I_C = 10\text{mA}, V_{CE} = 1.0\text{V}$ $I_C = 100\text{mA}, V_{CE} = 2.0\text{V}$	40 20	120	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage *	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$		0.25	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$	0.7	0.85	V
Small Signal Characteristics					
C_{obo}	Output Capacitance	$V_{CB} = 5.0\text{V}, I_E = 0, f = 1.0\text{MHz}$		4.0	pF
C_{ibo}	Input Capacitance	$V_{EB} = 0.5\text{V}, I_C = 0, f = 1.0\text{MHz}$		5.0	pF
h_{fe}	Small -Signal Current Gain	$I_C = 10\text{mA}, V_{CE} = 10\text{V}, R_G = 2.0\text{k}\Omega,$ $f = 100\text{MHz}$	5.0		
Switching Characteristics					
t_s	Storage Time	$I_{B1} = I_{B2} = I_C = 10\text{mA}$		13	ns
t_{on}	Turn-On Time	$V_{CC} = 3.0\text{V}, I_C = 10\text{mA}, I_{B1} = 3.0\text{mA}$		12	ns
t_{off}	Turn-Off Time	$V_{CC} = 3.0\text{V}, I_C = 10\text{mA}, I_{B1} = 3.0\text{mA},$ $I_{B2} = 1.5\text{mA}$		18	ns

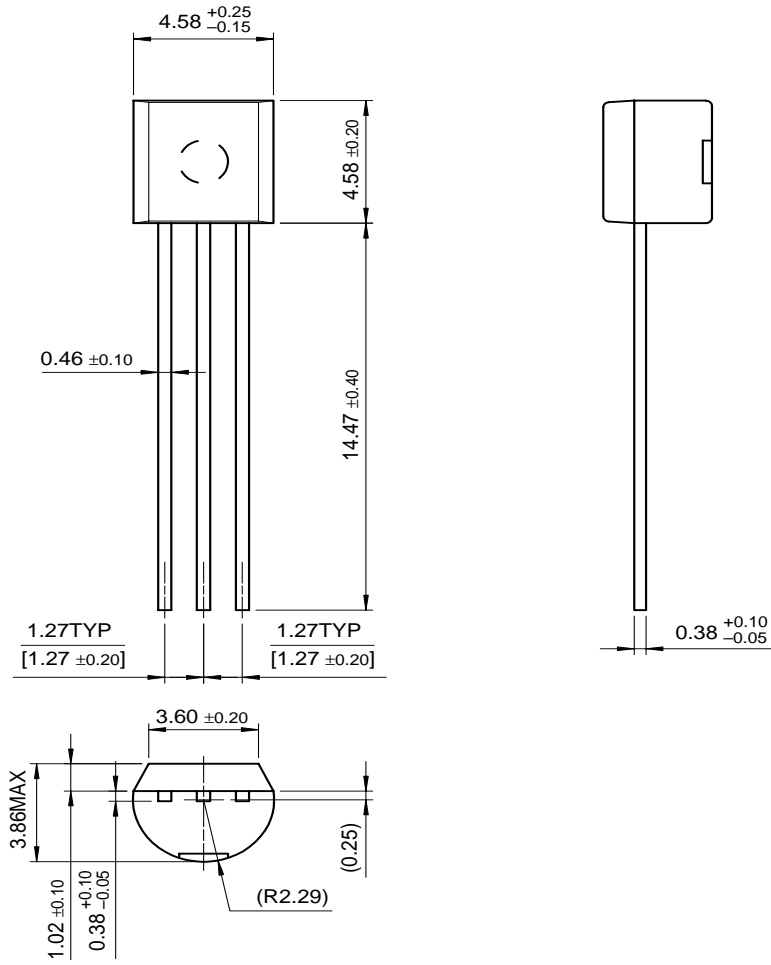
* Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$

Thermal Characteristics $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Max.	Units
P_D	Total Device Dissipation	350	mW
	Derate above 25°C	2.8	mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	$^\circ\text{C}/\text{W}$

Package Dimensions

TO-92



Dimensions in Millimeters

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